

What is claimed is:

[Claim 1] 1. A reusable composite film comprising:

a layer of resilient and nontoxic material;
a sealing layer coated onto one side of said composite layer; and
a plurality of micro-gaps distributed within a pre-selected area on said composite film, wherein each of said micro-gaps traverses thickness of said composite film, wherein, in a static state, i.e., no pressure/stress exerted on said composite film, each of said micro-gaps comprises a split upper seam portion with edge ridges demonstrated on a top surface of said composite film and a close lower seam portion communicating with said split upper seam portion.

[Claim 2] 2. The reusable composite film of claim 1 wherein said composite film has a bottom surface, and wherein when pressure is exerted on said bottom surface in thickness direction, said initially close lower seam portion become split and said split upper seam portion expands to facilitate pressure regulation.

[Claim 3] 3. The reusable composite film of claim 1 wherein said split upper seam portion and said lower seam portion form a craze that tapers off from said top surface to said bottom surface of said packaging film when pressure is exerted on said bottom surface in thickness direction.

[Claim 4] 4. The reusable composite film of claim 1 wherein said resilient and nontoxic material is selected from the group consisting of acrylic resins, polyester, polyethylene (PE), polypropylene (PP), copolymer of PE and PP, ethylene-styrene copolymer (ES), cyclo olefin, polyethylene terephthalate (PET), ethylenevinyl alcohol (EVOH), polyvinyl alcohol (PVA), ethylene-vinyl acetate (EVA), ethylene/methacrylic acid (E/MAA) ionomer, Nylon, polyethylene naphthalate (PEN), poly ether ether ketone (PEEK), polycarbonate (PC),

polysulfone, polyimide (PI), polyacrylonitrile (PAN), styrene acrylonitrile (SAN), polyurethane (PU), and any combinations thereof.

[Claim 5] 5. The reusable composite film of claim 1 wherein said sealing layer is made from fatty acids or their derivatives, starch, amyloid materials or their derivatives, lipids, oleaginous materials, wetting agents, or waxes.

[Claim 6] 6. The reusable composite film of claim 1 wherein the said micro-gaps are formed using an impression process, which is performed after said sealing layer is formed on said composite layer.

[Claim 7] 7. The reusable composite film of claim 1 wherein said composite film is jointed to a reclosable zipper, and wherein said pre-selected area is adjacent to said reclosable zipper.

[Claim 8] 8. The reusable composite film of claim 1 further comprises oxygen scavenger for preventing oxygen from permeating through the composite film.

[Claim 9] 9. The reusable composite film of claim 1 wherein said micro-gaps have an average gap length of about 0.1 μm ~500 μm .

[Claim 10] 10. A reusable air-permeable packaging film formed of a layer of resilient and nontoxic material, said packaging film comprising a plurality of micro-gaps distributed within a pre-selected area on said packaging film, wherein each of said micro-gaps traverses thickness of said packaging film, and wherein, in a static state, i.e., no pressure/stress exerted on said packaging film, each of said micro-gaps comprises a split upper seam portion with edge ridges demonstrated on a top surface of said packaging film

and a close lower seam portion communicating with said split upper seam portion.

[Claim 11] 11. The reusable air-permeable packaging film of claim 10 wherein said packaging film has a bottom surface, and wherein when pressure is exerted on said bottom surface in thickness direction, said initially close lower seam portion become split and said split upper seam portion expands to facilitate pressure regulation.

[Claim 12] 12. The reusable air-permeable packaging film of claim 11 wherein said split upper seam portion and said lower seam portion form a craze that tapers off from said top surface to said bottom surface of said packaging film when pressure is exerted on said bottom surface in thickness direction.

[Claim 13] 13. The reusable air-permeable packaging film of claim 10 wherein said material film is jointed to a reclosable zipper, and wherein said pre-selected area is adjacent to said reclosable zipper.

[Claim 14] 14. The reusable air-permeable packaging film of claim 10 wherein said resilient and nontoxic material is selected from the group consisting of acrylic resins, polyester, polyethylene (PE), polypropylene (PP), copolymer of PE and PP, ethylene-styrene copolymer (ES), cyclo olefin, polyethylene terephthalate (PET), Nylon, ethylenevinyl alcohol (EVOH), polyvinyl alcohol (PVA), ethylene-vinyl acetate (EVA), ethylene/methacrylic acid (E/MAA) ionomer, polyethylene naphthalate (PEN), poly ether ether ketone (PEEK), polycarbonate (PC), polysulfone, polyimide (PI), polyacrylonitrile (PAN), styrene acrylonitrile (SAN), polyurethane (PU), and any combinations thereof.